



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,937	08/10/2000	I SOO LEE	YOU& I-1	3998

26479 7590 12/05/2001

STRAUB & POKOTYLO
1 BETHANY ROAD, SUITE 83
BUILDING 6
HAZLET, NJ 07730

EXAMINER

GONZALEZ, JULIO C

ART UNIT PAPER NUMBER

2834

DATE MAILED: 12/05/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/601,937

Applicant(s)

LEE, I SOO

Examiner

Julio C. Gonzalez

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

- ✓ 1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the H-bridge circuit of a power switching stage been without inter-connections and the rotor having empty spaces between every each magnet in the rotor and the photo sensor coupled to the commutation encoder and the rotor laminations as disclosed in claim 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. }
- ✓ 2. The drawings are objected to because they do not point out clearly some of the main parts of the invention such as the sensing regions, photo sensors and bridge circuits. From the specification is difficult to point out and identify those components. Also, defining the cancel phenomenon using the drawings and explanation filed on 9/10/01 help defined the invention. Examiner suggests that those drawings be included in the disclosure of the invention. Correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 5 and 6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 6, applicant discloses new matter such as a new formula for the sensing regions which is not fully described in the specifications. Moreover, power transistors are disclosed in the claims. Also, photo transistors are disclosed and are not supported by the specifications. The previous limitations will not be taken into consideration.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1-6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, what is meant by the stator been wound in parallel by phases? Are the coil windings place in parallel to each other or is the stator been in parallel with respect to the windings? How is it possible for the winding coils not to be connected to each other when in figure 1, the winding coils are all connected to each other?

In claim 6, what is meant by the windings been independtly connected? Are the windings functioning independtly from the invention? If the winding are connected to the bridge circuit then wouldn't the bridge circuit have some control over the windings? What is meant by the bridge been without inter-connection?

The variable (n-b) from the formula are not defined in the claim.

In order to advance prosecution in the merits, the Prior Art will be applied as best understood by the examiner.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (Patent # 4,882,524) in view of Sebastian et al and Bessiere.

Lee discloses a constant power brushless DC motor comprising a stator 4 having multi-phases, each of the winding coils of the stator which are not connected with one another is connected to each of n full H-bridges, n full H-bridges are connected to a DC power supply; a rotor 7 having predetermined number of polarities, which is required to concentrate magnetic flux on excitation area; a commutation encoder (see figure 1) including sensing regions and nonsensing regions (column 8, line 60-65), the commutation encoder being externally set to one side of the shaft 11 of the rotor; and two photo sensors (column 2, line 2) set to each phase, the two photo sensors being connected to half H-bridge of each phase, to turn on/off the half H-bridge, the distance between the sensing regions of the commutator encoder is determined to allow a phases among n phases to be excited all the time, the a photo sensors recognizing the a phases excited (column 6, lines 8-15). Moreover, Lee discloses the distance between the sensing regions (column 4, lines 27-34), the number of sensing regions in the commutation encoder (column 4, lines 20-22) and the distance between the photo

sensors on a sensor plate (column 5, lines 41-45). Also, Lee discloses that the number of phases inexcited can be more than one (column 5, lines 59-64).

However, Lee does not disclose that the wounds are connected in parallel and that the stator has narrow slots to remove cancel phenomenon.

On the other hand Bessiere discloses a narrow slot for the purpose to eliminate armature reaction flux on the stator (see figure 3 and column 3, lines 7-16). However, Bessiere does not disclose the coils connected in parallel. } X

On the other hand, Sebastian et al discloses coils of a brushless DC motor connected in parallel (see figure 5) for the purpose of obtaining high current and low voltage (column 4, lines 5-7).

It would have been obvious to one having ordinary skill in the art to design a brushless DC motor with multi phases, a shaft, a rotor and a commutator as disclose by Lee and to have narrow slots in the stator for the purpose to reduce armature flux as disclosed by Bessiere and to have the coils wounded in parallel for the purpose of obtaining high current and low voltage as disclose by Sebastian et al.

- ✓ 9. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Sebastian et al and Bessiere in view of ordinary skill in the art.

Lee discloses a constant power brushless DC motor comprising a stator 4 having multi-phases, each of the winding coils of the stator which are not connected with one another is connected to each of n full H-bridges, n full H-bridges are connected to a DC power supply; a rotor 7 having predetermined number of polarities, which is required to

concentrate magnetic flux on excitation area; a commutation encoder (see figure 1) including sensing regions and nonsensing regions (column 8, line 60-65), the commutation encoder being externally set to one side of the shaft 11 of the rotor; and two photo sensors (column 2, line 2) set to each phase, the two photo sensors being connected to half H-bridge of each phase, to turn on/off the half H-bridge, the distance between the sensing regions of the commutator encoder is determined to allow a phases among n phases to be excited all the time, the a photo sensors recognizing the a phases excited (column 6, lines 8-15). Moreover, Lee discloses the distance between the sensing regions (column 4, lines 27-34), the number of sensing regions in the commutation encoder (column 4, lines 20-22) and the distance between the photo sensors on a sensor plate (column 5, lines 41-45). Also, Lee discloses that the number of phases inexcited can be more than one (column 5, lines 59-64).

However, Lee does not disclose that the wounds are connected in parallel and that the stator has narrow slots to remove cancel phenomenon.

On the other hand Bessiere discloses a narrow slot for the purpose to eliminate armature reaction flux on the stator (see figure 3 and column 3, lines 7-16). However, Bessiere does not disclose the coils connected in parallel.

On the other hand, Sebastian et al discloses coils of a brushless DC motor connected in parallel (see figure 5) for the purpose of obtaining high current and low voltage (column 4, lines 5-7).

Lee, Sebastian et al and Bessiere disclose the claimed invention except for specific formulas disclosed which would give a specific range.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to come with those optimum ranges that the applicant discloses, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re Aller*, 105 USPQ 233.

✓ 10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Sebastian et al, Bessiere, Gritter and ordinary skill in the art.

Lee discloses a constant power brushless DC motor comprising a stator 4 having multi-phases, each of the winding coils of the stator which are not connected with one another is connected to each of n full H-bridges, n full H-bridges are connected to a DC power supply; a rotor 7 having predetermined number of polarities, which is required to concentrate magnetic flux on excitation area; a commutation encoder (see figure 1) including sensing regions and nonsensing regions (column 8, line 60-65), the commutation encoder being externally set to one side of the shaft 11 of the rotor; and two photo sensors (column 2, line 2) set to each phase, the two photo sensors being connected to half H-bridge of each phase, to turn on/off the half H-bridge, the distance between the sensing regions of the commutator encoder is determined to allow a phases among n phases to be excited all the time, the a photo sensors recognizing the a phases excited (column 6, lines 8-15). Moreover, Lee discloses the distance between the sensing regions (column 4, lines 27-34), the number of sensing regions in the commutation encoder (column 4, lines 20-22) and the distance between the photo sensors on a sensor plate (column 5, lines 41-45). Also, Lee discloses that the number

of phases inexcited can be more than one (column 5, lines 59-64). Moreover, Lee discloses a sensing region formula and shaft angle formula (see claim 2)

However, Lee does not disclose that the wounds are connected in parallel and that the stator has a narrow slots to remove cancel phenomenon.

On the other hand Bessiere discloses a narrow slot for the purpose to eliminate armature reaction flux on the stator (see figure 3 and column 3, lines 7-16). However, Bessiere does not disclose the coils connected in parallel.

On the other hand, Sebastian et al discloses coils of a brushless DC motor connected in parallel (see figure 5) for the purpose of obtaining high current and low voltage (column 4, lines 5-7).

However, neither Lee, Bessiere nor Sebastian et al disclose that the magnets have empty spaces in between them.

On the other hand, Gritter discloses for the purpose of controlling the switching of the current direction through the motor winding thus making the motor inexpensive that the rotor magnets have an empty space in between (see figure 5).

It would have been obvious to one having ordinary skill in the art to design a brushless DC motor with multi phases, a shaft, a rotor and a commutator as disclosed by Lee and to have narrow slots in the stator for the purpose to reduce armature flux as disclosed by Bessiere and to have the coils wounded in parallel for the purpose of obtaining high current and low voltage as disclose by Sebastian et al and to have empty spaces in between the magnets for the purpose of controlling the switching of the

current direction through the motor winding thus making the motor inexpensive as disclosed by Gritter.

Also, Lee, Sebastian et al, Bessiere and Gritter disclose the claimed invention except for specific formula for the sensing regions disclosed which would give a specific range.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to come with those optimum ranges that the applicant discloses, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re Aller*, 105 USPQ 233.

✓ 11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Sebastian et al, Bessiere, Gritter, Le Flem and ordinary skill in the art.

Lee discloses a constant power brushless DC motor comprising a stator 4 having multi-phases, each of the winding coils of the stator which are not connected with one another is connected to each of n full H-bridges, n full H-bridges are connected to a DC power supply; a rotor 7 having predetermined number of polarities, which is required to concentrate magnetic flux on excitation area; a commutation encoder (see figure 1) including sensing regions and nonsensing regions (column 8, line 60-65), the commutation encoder being externally set to one side of the shaft 11 of the rotor; and two photo sensors (column 2, line 2) set to each phase, the two photo sensors being connected to half H-bridge of each phase, to turn on/off the half H-bridge, the distance between the sensing regions of the commutator encoder is determined to allow a

phases among n phases to be excited all the time, the a photo sensors recognizing the a phases excited (column 6, lines 8-15). Moreover, Lee discloses the distance between the sensing regions (column 4, lines 27-34), the number of sensing regions in the commutation encoder (column 4, lines 20-22) and the distance between the photo sensors on a sensor plate (column 5, lines 41-45). Also, Lee discloses that the number of phases inexcited can be more than one (column 5, lines 59-64). Moreover, Lee discloses a sensing region formula and shaft angle formula (see claim 2)

However, Lee does not disclose that the wounds are connected in parallel and that the stator has a narrow slots to remove cancel phenomenon.

On the other hand Bessiere discloses a narrow slot for the purpose to eliminate armature reaction flux on the stator (see figure 3 and column 3, lines 7-16). However, Bessiere does not disclose the coils connected in parallel.

On the other hand, Sebastian et al discloses coils of a brushless DC motor connected in parallel (see figure 5) for the purpose of obtaining high current and low voltage (column 4, lines 5-7).

However, neither Lee, Bessiere nor Sebastian et al disclose that the magnets have empty spaces in between them.

On the other hand, Gritter discloses for the purpose of controlling the switching of the current direction through the motor winding thus making the motor inexpensive that the rotor magnets have an empty space in between (see figure 5).

However, neither Lee, Bessiere nor Sebastian et al nor Gritter disclose that the flux can be canceled.

On the other hand, Le Flem discloses for the purpose of increasing local airgap turbulence and improving heat transfer between the stator and rotor that by narrowing the stator slots the flux can be eliminated (column 4, lines 3-8).

It would have been obvious to one having ordinary skill in the art to design a brushless DC motor with multi phases, a shaft, a rotor and a commutator as disclosed by Lee and to have narrow slots in the stator for the purpose to reduce armature flux as disclosed by Bessiere and to have the coils wound in parallel for the purpose of obtaining high current and low voltage as disclosed by Sebastian et al and to have empty spaces in between the magnets for the purpose of controlling the switching of the current direction through the motor winding thus making the motor inexpensive as disclosed by Gritter and to narrow the stator slots for the purpose of increasing local airgap turbulence and improving heat transfer between the stator and rotor as disclosed by Le Flem.

Also, Lee, Sebastian et al, Bessiere and Gritter disclose the claimed invention except for specific formula for the sensing regions disclosed which would give a specific range.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to come with those optimum ranges that the applicant discloses, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In *re Aller*, 105 USPQ 233.

Response to Arguments

12. In response to applicant's arguments, the recitation "constant-power" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

13. Applicant's arguments filed 9/10/01 have been fully considered but they are not persuasive.

Lee (Patent # 4,882,524) discloses a brushless DC motor (see title) with a constant excitation winding phase which could lead to a constant output power (column 3, lines 34-37). Applicant argues that constant torque yields constant power, but other factors such as constant voltage, current, excitations and constant functioning of the device can also lead to constant power. Moreover, the windings are disclosed to be independently connected of other phases (column 3, lines 22-28) and even the applicant's own invention shows in figure 1 the windings connected to each other, which does not make them "independently". Also, the prior art shows each phase of the stator is connected in parallel (column 2, lines 16-18 & column 7, lines 14-17) and the phases can be excited or inexcited since the commutator can turn on and off the transistors thus cutting off the

current to the phases which would make the phases been excited or inexcited (column 6, lines 8-15; column 7, lines 25-34). Moreover, the cancel phenomenon is not well-defined in the specifications, much less in the claims in order to determine the purpose of it. There are many definitions for the cancel phenomenon (see patents 5,856,995 column 2, line 55 and 5,669,063 column 4, line 1) and from the claims, any cancel phenomenon could apply. Defining the cancel phenomenon in the claims and in the specifications clearly would help distinguish the new invention from previous prior art, but as it stands, the cancel phenomenon is not defined in the claims.

With respect to claim 6, it should be emphasized that "apparatus claims must be structurally distinguishable from the prior art." MPEP 2114. In re Danly, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959) it was held that apparatus claims must be distinguished from prior art in terms of structure rather than function. In Hewlett-Packard Co v Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), the court held that: "Apparatus claims cover what a device is, not what it does." (emphases in original). To emphasize the point further, the court added: "An invention need not operate differently than the prior art to be patentable, but need only be different" (emphases in original).

That is, in an apparatus claim, if a prior art structure discloses all of the structural elements in the claim, as well as their relative juxtaposition, then it reads on the claim, regardless of whether or not the function for which the prior art structure was intended is the same as that of the claimed invention.

14. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., output torque of the present invention been flat and allowing each phase to realize a rectangular torque scheme, the constant torque yielding constant power, each of the winding coils not connected to one another, phases wound in parallel without interconnections, the cancel phenomenon is the colliding of flux traveling in opposite directions through the stator) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

15. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, all of the prior art deals with dynamo DC motors with magnets and two of the main references are even brushless DC motors. All the references are related and anyone skill in the art would recognize the elements of the inventions.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is (703) 305-1563. The examiner can normally be reached on M-F (8AM-5PM).

Application/Control Number: 09/601,937
Art Unit: 2834

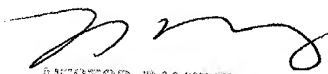
Page 16

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Jcg

November 22, 2001


NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800